Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Request of PTC-220, LLC for Waivers of Certain 220 MHz Rules	)	**WT Docket No. 08-256**
	)	
Construction Progress Report	)	

To: Chief, Wireless Telecommunications Bureau

PTC-220, LLC
CONSTRUCTION PROGRESS REPORT

I. INTRODUCTION

PTC-220, LLC ("PTC-220") submits this Construction Progress Report to satisfy the requirements of paragraph 16 of the Memorandum Opinion and Order ("*Waiver Order*") adopted by the Federal Communications Commission ("FCC") on June 25, 2009.[1] This Report details the progress made during the past six months in implementing the Systemwide Build-out Plan (the "Build-out Plan") submitted by PTC-220 on November 1, 2010, in the above-referenced docket. The Build-out Plan explained how PTC-220's 220 MHz licenses ("Licenses") would be used in deploying a nationwide positive train control ("PTC") system, as required by Federal statute. The construction of the Licenses will be undertaken in large part by each of PTC-220's

[1] *Request of PTC-220, LLC for Waivers of Certain 220 MHz Rules*, Memorandum Opinion and Order, 24 FCC Rcd 8537 (2009).

member railroads,[2] although PTC-220 will also coordinate construction activities by non-member railroads.

II. SITE BUILD-OUT ACTIVITY

Since its last Construction Progress Report filed May 1, 2013 (the "May 2013 Report"), PTC-220's member railroads have continued to build new or prepare existing base station sites, and install base station radios. As before, preparatory work at existing sites includes, among other things, coverage predictions, design and installation of antenna systems, upgrading of site power systems, site pre-wiring, and backhaul design. The table below indicates the progress to date for each PTC-220 member railroad, by State, for base station site preparation and base radio installations. Some of the installed radios are being actively used in various field testing programs, while others are currently powered off, awaiting final frequency coordination.

State	BNSF		CN		CP		CSX		KCS		NS		UP	
	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio
AL	4	4					21	19			18	18		
AR	5	5							9				14	
AZ	20	20											8	
CA	39	39											36	2
CO	8	8											8	
FL							39	9						
GA							17	10			31	23		
IA	22	22			24								15	
ID	5	5											10	
IL	22	22	31		4		17	8			4		35	11

[2] PTC-220's members are BNSF Railway ("BNSF"), Canadian National Railway ("CN"), Canadian Pacific Railway ("CP"), CSX Transportation ("CSX"), Kansas City Southern Railway ("KCS"), Norfolk Southern Railway ("NS"), and Union Pacific Railroad ("UP").

State	BNSF		CN		CP		CSX		KCS		NS		UP	
	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio	Site Prep	Radio
IN			6				43	24			9			
KS	30	28							3				13	1
KY			2				68	35			10	10		
LA	5	5	8				1	1	29		2	2	8	
MA							13	8						
MD							25	5			2	2		
MI			10				20							
MN	25	25	6		4								1	
MO	30	26	12		4				7				20	
MS	3	3	4						6		11	11		
MT	54	49												
NC							29	31			15	8		
ND	38	32			10									
NE	21	20											30	4
NJ							2	1						
NM	15	15											5	
NV													11	
NY					14		44	31						
OH							59	21			6	5		
OK	25	21							6				3	
OR	1	1											21	
PA					9		17	5			7	4		
SC							19	15			15	13		
SD	1	1												
TN	2	2					38	22			25	22		
TX	38	38							18				65	
UT													7	
WA	54	52											6	
WI			24										2	
WV							86	36						
WY													17	
VA							50	14			19	11		
Total	**467**	**443**	**103**		**69**		**608**	**295**	**78**		**174**	**129**	**335**	**18**

Totals	
Site Prep	**Radio**
1834	**885**

In addition to the base station deployment programs, each member railroad is also building fixed wayside sites and installing radios, as well as installing mobile radios in their locomotive fleets.

Historic Review Process Impacts Tower Site Construction

Although PTC-220 continues to make progress on construction of its base stations, installation of its wayside stations has largely come to a halt since the submission of the May 2013 Report as a result of ongoing challenges arising from compliance with Section 106 of the National Historic Preservation Act ("NHPA") and its implementing rules. These rules require an extensive environmental and historic evaluation to determine if a proposed new tower is likely to have "a significant effect upon the quality of the human environment," and thus require further processing by the FCC.[3] The historic review evaluation, as interpreted by the FCC, requires the PTC-220 member railroad to notify and coordinate with the FCC, other federal agencies, State officials, and representatives of Native American tribes on a site-by-site basis for each new tower they propose to build.

Since the submission of the May 2013 Report, the FCC determined that site-by-site processing of the over 20,000 new wayside stations required for PTC would overwhelm any current processing capabilities of the FCC, Native American tribes, and state historic preservation offices, and would result in delays to PTC site construction. Since that

[3] *See* 47 C.F.R. §§ 1.1305-1.1307.

determination was made, PTC-220 has worked closely with the FCC and the Advisory Council on Historic Preservation ("ACHP") to initiate a process to develop a Program Comment that would streamline the review process to the greatest extent possible.[4] Specifically, on July 17, 2013, FCC staff and PTC-220 representatives met with the Committee of Federal Agency Programs of the ACHP to provide information about the nationwide PTC deployment requirement and to discuss the challenges occasioned by review for a project of its scale. That presentation has led to follow-up conversations and mutual efforts to streamline the process.

In September 2013, the FCC released two Scoping Documents seeking comment from Tribal authorities as well as members of the public on the development of a Program Comment that would govern the historic review of PTC wayside stations.[5] The comment filing deadline was recently delayed until November 15, 2013. The FCC also scheduled meetings in October and early November 2013 with Tribal authorities in Tulsa, Oklahoma and Rapid City, South Dakota to initiate consultation on the Program Comment. However, these two meetings were postponed due to the October 2013 government shutdown. The Rapid City, South Dakota meeting has now been rescheduled for November 21-22, 2013 and the Tulsa, Oklahoma meeting has been rescheduled for December 10-12, 2013. These extensions are likely to cause further

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[4] *See* 36 C.F.R. § 800.14(e). A Program Comment allows a federal agency to request the ACHP to comment on a category of undertakings in lieu of conducting individual Section 106 reviews. *See* "Program Alternatives," ACHP, www.achp.gov/progalt/ (last accessed Oct. 16, 2013).

[5] *Comment Sought on Scoping Document for Development of a Proposed Program Comment to Govern Review of Positive Train Control Facilities under Section 106 of the National Historic Preservation Act*, WT Docket No. 13-240, Public Notice, DA 13-1980 (Sept. 27, 2013); *CGB's Office of Native Affairs and Policy and WTB Release Scoping Document to Initiate Tribal Consultation on a Proposed Program Comment to Govern Review of Positive Train Control Facilities under Section 106 of the National Historic Preservation Act*, WT Docket No. 13-240, Public Notice, DA 13-1985 (Sept. 27, 2013).

delay in establishing a process by which PTC wayside stations can be reviewed and approved for deployment.

The PTC-220 members plan to continue to meet regularly with FCC staff with the goal of arriving at a comprehensive historic review process for all PTC wayside stations as soon as possible. However, based on indications provided after the government shutdown, the FCC does not expect that the Program Comment will be released until March 2014, which means that the deployment of wayside stations would not be able to proceed until sometime after that date, and at least some of the sites will likely require some form of additional review.

III. TTCI ACTIVITIES

As mentioned in previous filings, PTC-220 has engaged Transportation Technology Center, Inc. ("TTCI") for a number of technical support services related to PTC. Among these services is the radiofrequency ("RF") network design of congested areas, and management and coordination of PTC-220's spectrum holdings.

One of TTCI's first assignments was to analyze PTC spectrum needs in several key rail centers to determine if additional spectrum is necessary in any of these areas. This work is complete, with final reports delivered for Chicago, Los Angeles, Kansas City, St. Louis, New Orleans, Minneapolis/Saint Paul, Toledo and the New York/Newark area. While the spectrum needs phase of TTCI's work is nearing completion, TTCI has already commenced the next phase, which involves developing the actual network designs for these and other congested areas. To date, TTCI has completed a full RF design for St. Louis, and designs for Dallas/Fort Worth, Chicago, Kansas City and Los Angeles are underway.

TTCI applied for and won a Federal Railroad Administration ("FRA") grant to undertake RF network designs for three cities, and this funding has been applied to work in the Chicago, Kansas City, and the Dallas/Fort Worth areas. This work will run in parallel with PTC-220 funded work in, Minneapolis-St. Paul, Toledo, and New Orleans.. TTCI has applied recently for another FRA grant to perform PTC RF network design for the Northeast Corridor ("NEC"). PTC-220 has initiated discussions with all NEC railroads so that an efficient, non-interfering solution can be cooperatively planned.

In the area of spectrum management and coordination, TTCI's Frequency Application Management System ("FAMS") is now largely in place. FAMS will hold and manage information about PTC frequency and time slot plans across the nation, and also automate the flow of this information from the RF planning tools to the databases that hold the data. Basic FAMS functionality is in production, with additional functionality scheduled for future upgrades. FAMS has been demonstrated to non-PTC-220 members, with very positive feedback.

IV. EQUIPMENT DEVELOPMENT

The four radio models[6] developed by Meteorcomm LLC have been in production since 2012 by two manufacturers and are effectively meeting the industry's demand. The radio hardware designs are proving to be very stable, with no known serious bugs. Current software supports all basic PTC functionality, and new functions and features will be added through a

[6] The four radio models are for installation in: locomotives, wayside sites, and base station sites with either 24- or 48-volt power supplies. The FCC IDs for these radios are BIB63010, BIB63020, BIB63030-24, and BIB63030-48.

program of scheduled software releases. As previously reported, all radios have Part 90 certification and Meteorcomm recently received Part 80 certification for these radios to accommodate users who might choose to operate on Automated Maritime Telecommunications System spectrum below 220 MHz.

V. FIELD TESTING

Most PTC-220 member railroads have ongoing field test programs designed to validate preliminary network designs and to assess the performance of over-the-air protocols under field conditions. For example, one PTC-220 railroad continues to conduct PTC system tests on designated subdivisions. Also, in southern California, two PTC-220 railroads along with a commuter road continue collaborative testing, including back office federation. This test shows interoperability through shared base stations. In addition, CSX and NS have conducted field testing to validate communications system interoperability by passing PTC data across federated links between back offices. This testing consisted of large file transfers and base handoffs between PTC operators.

A number of railroads are engaged in drive testing in selected areas, which compares predicted to actual signal strengths and message error rates. These tests are invaluable in fine-tuning the RF prediction models to achieve the best accuracy. They also help to gauge the benefit of certain RF technologies, such as antenna diversity on the locomotives. PTC-220 has contracted for a large-scale drive testing effort that will provide data to optimize prediction tools over a wide variety of terrain types. The field testing programs continue to be instructive, and will increase in scale over the coming months.

VI. SPECTRUM

With TTCI's spectrum needs analysis work nearing completion, the emerging picture is that PTC-220's spectrum will be sufficient to support PTC in most areas, provided that PTC-220's pending waiver requests, described below, are granted. Chicago is known to be one exception, and PTC-220 finalized the purchase of additional spectrum in that area in late September, 2013. The only remaining significant uncertainty on spectrum needs is in the New York/Newark area, and TTCI's analysis of this area shows a potential need for spectrum. An initial spectrum availability analysis has been conducted and license holders have been contacted regarding the potential sale of their available spectrum.

On February 1, 2013, PTC-220 filed requests for waivers of certain FCC rules which, *inter alia*, limit power and antenna height of transmitters in the 221-222 MHz band.[7] As outlined in the filing and in two previous presentations to the FCC, the waivers are necessary to allow full and efficient use of PTC-220's licenses for PTC. Without the waivers, PTC-220 would likely need to acquire additional spectrum in many areas, and would have less spectrum to lease to non-member railroads. Comments and reply comments filed in response to the waiver request were all positive except those from the National Rural Telecommunications Cooperative ("NRTC") and three other utility entities. PTC-220 has worked with NRTC to address the remaining issues and together, PTC-220 and NRTC have identified three measures to resolve NRTC's concerns: (1) provide access to PTC-220's database showing existing and planned PTC base stations; (2)

[7] *See* Request of PTC-220, LLC for Waivers of Sections 90.729(b) and 90.723(f) of the Commission's Rules, WT Docket No. 13-59 (filed Feb. 1, 2013).

develop an Out-of-Band Emissions ("OOBE") prediction tool; and (3) adopt an agreed-upon protocol that stipulates the time and action to be taken by PTC-220 upon discovery of an interfering base station. To date, PTC-220 has demonstrated FAMS and an OOBE web tool to NRTC, and has presented an initial proposal for the interfering base station protocol.

Finally, PTC-220 continues to support dialogs with a number of non-member railroad entities interested in leasing spectrum for their own PTC deployment. Of the approximately 19 ongoing discussions, 14 have progressed to the point of having a non-disclosure agreement ("NDA") in place, including 7 with commuter railroads. Currently, two long term leases have been executed, in addition to four short term leases for testing purposes.

VII. INTERNATIONAL CROSS-BORDER SPECTRUM ARRANGEMENTS

PTC-220's member railroads have worked closely with the leadership and staff of the FCC's International Bureau and the Wireless Telecommunications Bureau to coordinate operation of positive train control along the nation's international borders. The current interim sharing arrangements governing use of the 220-222 MHz frequency band between the US and Canada and the US and Mexico are fourteen and nineteen years old, respectively, and, as currently written, do not appear to permit PTC operations near US international boundaries. The 1999 interim sharing arrangement with Canada, for example, imposes certain restrictions on 220-222 MHz operations within 120 kilometers of the US-Canada border, including 5 kilohertz channelizations with designated, service-specific US and Canadian uses, a maximum power flux density ("pfd") at any point at or beyond the border not to exceed -108 dBW/m^2, a maximum EIRP limit in the 220-221 MHz band that ranges from 5 watts to 500 watts, depending on antenna height, and a maximum EIRP limit in the 221-222 MHz of 50 watts with a maximum

height above average terrain of seven meters.[8] The 1994 arrangement with Mexico imposes similar restrictions.[9]

Due to very low levels of incumbency in the 220-222 MHz spectrum in both Canada and Mexico and anticipated changes in the use of the band similar to those the United States is experiencing, the current restrictions along the US international boundaries no longer appear to be necessary to protect existing or planned spectrum users in Canada and Mexico. Against this backdrop of limited incumbency and changing usage in the 220-222 MHz bands of the neighboring countries, the FCC's International Bureau raised the issue of reforming the existing Interim Arrangement with the Canadian regulator, Industry Canada, during a January 2013 meeting in Ottawa, Ontario. With the support of PTC-220 member railroads, the FCC's International Bureau successfully placed the need for new cross-border coordination on the agenda of the Radio Technical Liaison Committee ("RTLC"), which provides a forum for direct exchange of information between the technical experts of both Canada and the US with the aim of promoting early coordination on spectrum allocations and achieving spectrum sharing arrangements necessary for the licensing of individual stations. Subsequent work sessions and correspondence between the FCC and Industry Canada led to an exchange of draft revisions that appear to promise reform of the existing arrangement to accommodate technical change and the new uses contemplated under the planned PTC deployment. While the sequestration of Federal

[8] *See* Interim Sharing Arrangement between the Canadian Department of Industry, the National Telecommunications and Information Administration, and the Federal Communications Commission Concerning the Use of the Band 220 to 222 MHz Along the United States-Canada Border (1999), *available at* http://transition.fcc.gov/ib/sand/agree/files/can-nb/220fin.pdf (last accessed Oct. 23, 2013).

[9] *See* Protocol Concerning the Allocation and Use of the Channels in the 220-222 MHz Band for Land Mobile Services Along the Common Border (1994), *available at* http://transition.fcc.gov/ib/sand/agree/files/mex-nb/220-222.pdf (last accessed Oct. 23, 2013).

budget funds may have impeded progress toward a revised arrangement with Industry Canada, PTC-220 member railroads remain cautiously optimistic that a mutually agreeable coordination agreement between the United States and Canada can be reached this year.

The status of cross-border negotiations with Mexico is less clear. On June 10, 2013, the Mexican President, Enrique Peña Nieto, signed into law an amendment to the constitution that includes an overhaul of the telecommunication and broadcast industries and creates a new telecommunication regulatory body: the Federal Institute of Telecommunications ("IFETEL"). IFETEL replaces Mexico's Federal Telecommunications Commission ("COFETEL") and will have expanded licensing and anti-trust powers. Under the constitutional amendment, the Mexican Congress was given until December 2013 to enact and approve enabling legislation to transition from COFETEL to IFETEL. While COFETEL is thus still nominally the Mexican telecommunications regulatory body, COFETEL has, for all practical purposes, stopped functioning and, thus, the FCC International Bureau currently has no Mexican counterpart with which to negotiate. Until IFETEL commences operations in earnest, revisions to the current US-Mexico protocol governing the 220 MHz spectrum along the southern border do not appear to be possible. PTC-220 member railroads will pursue all available means to support modifications to the cross-border arrangements between the United States and Mexico but, as an interim measure and to the extent necessary to support planned operations, PTC-220 member railroads may need to pursue alternative arrangements, such as applications for special temporary authority, to allow operations near the Mexican border.

VIII. NETWORK PLANNING TOOLS

As described in previous reports, PTC-220 engaged Meteorcomm to design a custom extension to the commercial Mentum Planet RF prediction tool to support PTC protocols. This work ended in March 2013 with the delivery of the tool, called ITCnet[10] Planning Module ("IPM"). This tool optimizes the frequency and TDMA time slot plans for PTC networks, and interfaces directly with the FAMS application developed by TTCI. PTC-220 has entered into a follow-on contract with Meteorcomm for development of some additional features for IPM, as well as for ongoing support of the product. Field testing of the IPM time slot plans has exposed issues that require modification of the planning method. PTC-220 anticipates that an improved version of IPM will be available on November 20, 2013. Base station frequency planning and usage authorization continues.

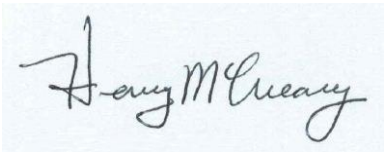
The Mentum Planet RF prediction tool with the IPM module is being offered to both PTC-220 members and non-members in a hosted environment supported by InfoVista (which acquired Mentum in 2012) under contract to PTC-220. Lessees of PTC-220 spectrum are provided access to the tools pursuant to a provision in the lease. PTC-220 is also working on a way for railroads in the process of negotiating for a lease to obtain some form of provisional access to the tools. The hosted environment makes possible the coordination of independent but geographically adjacent network design projects so that each design takes into account all adjacent projects. For this reason, it is important that all projects be implemented in a consistent way. PTC-220 has developed standards for the building of projects, and is working with

[10] ITCnet is the name of the over-the-air protocol used by Meteorcomm. "ITC" stands for Interoperable Train Control.

InfoVista to provide classroom training as well as WebEx sessions on specific topics. To date, 39 engineers have completed the training to be certified to use the PTC-220 hosted environment.

IX. CONCLUSION

PTC-220 continues to make substantial and steady progress in executing its Build-out Plan for base stations. However, the ability of PTC-220's members to fully deploy PTC service consistent with the planned schedule is being threatened by continued delays associated with the historic review process (affecting wayside station deployment) and with the on-going pendency of PTC-220's waiver requests. PTC-220 is actively engaged to resolve both issues as quickly as possible.



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November 1, 2013